CLAIMS:

1.   A method of processing images in images comprising curvilinear structures, the method comprising the following parallel steps:
-          a step of filtering said images;
-          a decision step intended to select the pixels of the image pertaining to an interesting curvilinear structure, said method being characterized in that the decision step comprises, in parallel, a sub-step of estimating the direction of each image pixel as well as a sub-step of analyzing the connectivity of neighboring pixels based on their directions at the end of the sub-step of estimating the direction of each image pixel, and a sub-step of selecting groups of pixels as a function of the result of said sub-step of analyzing the connectivity of neighboring pixels based on their directions, at the end of said step of filtering.

2.   A method of processing images as claimed in claim 1, characterized in that said step of filtering said images comprises a sub-step of selecting pixels, the selected pixels of an image being those that have a contrast which is larger than X times the variance of the noise in the image, X being a user-adjustable parameter.

3.   A method of processing images as claimed in claim 1 or 2, characterized in that said step of filtering said images uses two neighborhoods (N1) and (N2) of a given pixel, the gap (GAP) between these neighborhoods being user-adjustable.

4.   A method of processing images as claimed in claim 3, characterized in that the height (H) and the length (L) of said neighborhoods are user-adjustable.

5.   A method of processing images as claimed in any one of claims 1 to 4, characterized in that said sub-step of analyzing the connectivity of neighboring pixels based on their directions uses a neighborhood of a given pixel, this neighborhood extending in the direction of the pixel considered, this direction being determined during said sub-step of estimating the direction of each pixel of the image.

6.   A method of processing images as claimed in claim 5, characterized in that the length of said neighborhood is user-adjustable.

5   7.   A method of processing images as claimed in any one of claims 1 to 6, characterized in that said sub-step of selecting groups of pixels uses a user-adjustable parameter M, this parameter M allowing computation of the minimal sum of contrasts of the pixels of a given group required for this group to be selected.

10   8.   A method of processing images as claimed in any one of claims 1 to 7, intended to detect artery anomalies, characterized in that it further comprises the steps of:

skeletonizing for extracting a skeleton of curvilinear structures,

measuring artery diameters,

taking decisions on the basis of the diameters and rules predefined by an

15   operator.

9.   A method of processing images, intended to detect artery anomalies in three dimensions, having at least a first digitized image and a second digitized image of the same artery as inputs, characterized in that it comprises, in series, a method of:

20   processing images as claimed in any one of claims 1 to 7, applied to the first and the second digitized image, for giving a first and a second processed image, and the steps of:

skeletonizing, applied to the first and the second processed image, for extracting a skeleton of curvilinear structures of the first processed image and a skeleton of

25   curvilinear structures of the second processed image,

reconstructing a 3D image of the artery, based on the first and the second processed image and their skeletons, for giving a 3D image of the artery,

measuring artery diameters, based on the 3D image of the artery,

taking decisions on the basis of the diameters and rules predefined by an

30   operator.

10.   A computer program which can be carried out by means of a processor, intended to perform a method of processing images as claimed in any one of claims 1 to 9.

11.   An image-processing system comprising a computer intended to perform a computer program as claimed in claim 10, or a circuit intended to perform the method of processing images as claimed in any one of claims 1 to 9, a device for projecting images processed in accordance with said method and possibly a device for storing said images.

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12.   A medical scanning apparatus comprising an image acquisition device and an image-processing system as claimed in claim 11.